drug targets to block a certain cell phenotype, which they did successfully. Future work will involve development of curricular materials based on this freely available software package and an educational study to examine whether students' use of Netflux enhances comprehension compared with traditional approaches.

1760-Pos Board B670
Graduate Program in Cell Analysis and Modeling
Charles W. Wolgemuth, Ji Yu, Raquell Holmes.
Modern cell biology integrates biological research with cutting-edge technological advances and mathematical and computational modeling. To succeed in this burgeoning field, students from traditional biology backgrounds will require training that incorporates physics, math, and computer science. In addition, there is beginning to be a large flux of students from physics, engineering, math, and computer science who are interested in applying their skills to cell biology, but these students generally lack sufficient training in biology. To address the needs of both of these types of students, a new interdisciplinary graduate program in Cell Analysis and Modeling has begun at the University of Connecticut Health Center (UCHC). This program is geared to students who are interested in understanding the biophysical and biochemical mechanisms that underlie cell function. We use individually-tailored short courses to address each student's needs, while a minimal set of core classes cover a breadth of topics in modern cell biology. Our faculty are broadly multi-disciplinary, which allows students to work closely and concurrently with experimentalists and modelers, and we strongly encourage research projects that incorporate both of these types of approaches.

1761-Pos Board B671
Improvement of Learning and Teaching Efficiency by Web-Associated Seminars
Lars Kaestner, Anke Scholz, Sandra Ruppenthal, Benjamin Sauer, Martin Oberhofer, Peter Lipp.
We face the situation that the number of medical students is increasing annually, without an appropriate adaptation of human resources for teaching. The aim was to tackle that situation by conceptual changes that sustain or even improve the educational level and the professional quality.
Taking advantage of recent investments in the faculties IT-infrastructure we designed a web-associated teaching concept that combines the transfer of biological knowledge and the operation of web-associated design (TYPO 3). Small groups of students ($n \leq 10$) design a web-page under a given topic in a problem oriented manner. Each student has to evaluate/provide feedback to a given number of web-pages designed by other student-groups. Such the students can gain knowledge by ''e-learning'' and can based on the feed back consecutively improve their own presentation.
With this procedure we intend to cultivate self-contained learning and working in general. The web-pages become recourses of knowledge for the students during their preparations for the examinations and during their further studies. We expect this resources to grow over the next few years becoming a general compendium. We can provide students evaluation of the seminars, but will not (yet) have results in terms of success rate in examinations compared to conventional presentation based seminars as performed in previous years.

1762-Pos Board B672
Dimensional Analysis as a Tool to Introduce Biology Students to Physical Reasoning
Justin S. Bois.
As students of biology begin their studies in biological physics, an effective first lesson strives to develop a "feeling for the numbers" of biology [Phillips and Milo, *PNAS*, **106**, 21465-21471 (2009)], in which students become acquainted with the length, time, and energy scales associated with systems of interest and begin thinking quantitatively. The next crucial step is to use these numbers to make more general inferences. To this end, it is both instructive and useful to perform estimates on biological systems in the spirit of "Fermi problems." Though detailed calculations are unnecessary, estimation often requires extensive physical insight. While the student will ultimately learn the requisite physical principles, the task of performing estimates can initially prove daunting. An important too in nearly all physical contexts, dimensional analysis gives the comfort of being formulaic, yet still requires thought about what parameters might be important, without necessarily requiring deep physical understanding. This provides a gentler, though effective, introduction to physical reasoning for the uninitiated biologist. Furthermore, the process of performing dimensional analysis can expose interesting questions about what physical information is necessary, providing student-discovered segues into further physical topics. We successfully used this technique in a course for biology graduate students at the Max Planck Institute of Molecular Cell Biology and Genetics in Dresden, Germany. In this talk, I will discuss our approach to teaching dimensional analysis to biologists and discuss case studies in Brownian motion, cytoplasmic mixing, interpretation of single-molecule motor experiments, and microtubule buckling [Brangwynne, et al., *J. Cell Biol.*, **173**, 733-741 (2006)].

1763-Pos Board B673
Interdisciplinary Learning Experience in Biophotonics
James T. Gleeson, Arne Gericke, Robert Twieg, Doug Kline, John Stalvey.
Light provides a means to image, analyze, and manipulate living cells and tissues. Photonic applications have produced a wave of new discoveries that have revolutionized our understanding of a vast array of biological processes. The exceptional scientific breadth of biophotonics research makes it virtually impossible for a single science department to deliver all topics necessary for a well-rounded basic undergraduate education in this rapidly progressing scientific area; therefore, we developed a new interdisciplinary course. The instructors are from the Departments of Physics, Chemistry and Biological Sciences and the students come from each of those departments as well. The course includes lecture, discussions, team activities and projects, and practical experiments in optical foundations of fluorescence spectroscopy and microscopy, organic fluorophore synthesis, advanced spectroscopy, and the use of microscopy in cell biology. Students work in interdisciplinary groups, which fosters peer-to-peer learning and develops their communication skills in a cross-disciplinary setting. Students produce a portfolio which is used for assessment and they present final team projects dealing with the synthesis of organic dyes and their properties in vitro and when introduced into living cells or projects dealing with the three-dimensional visualization of fluorescently labeled cells. Pre- and post-assessment of student viewpoints revealed changes in attitude and perceptions. For example, as expected by the opportunities given in the course, more students indicated that they had ''designed, or worked with others to design, an experiment to test a hypothesis''. Following the course, there was an increase in the number of students who felt that they ''enjoy and feel comfortable working with others in lab settings to solve problems together''. Student attitudes toward team teaching by several instructors became more positive after the course, with a greater number of students feeling comfortable with a team-teaching approach.

1764-Pos Board B674
Construction of a Magnetic Needle Viscometer for Use in Research and Undergraduate Education
Thomas Lopez.
We have constructed a magnetic needle viscometer (MNV) to measure two dimensional interfacial viscosities in Langmuir monolayers at the air-water interface. This device provides an accessible introduction to the fields of soft materials, nanotechnology, and membrane biophysics. To construct our MNV we have followed the work of Zasadzinski and colleagues (1). Currently the focus of our design is on the development of real-time computer acquisition, image processing, and analysis. To accomplish this goal we have used LabVIEW, a popular software package for data acquisition and analysis. By achieving this, the MNV will be more student friendly. The graphic user interface (GUI) allows the user to control the functions of; coil power supplies, video capture system, water pumps, barrier direction, barrier speed, surface pressure, and molecular area. The GUI also has the ability to do real time image processing for needle speed extraction, allowing the user to respond and control experimental parameters accordingly. This apparatus will have applications in both research and undergraduate education. We will describe a preliminary lab experience designed for a sophomore level Modern Physics course.
Reference:
(1) Ding; Warriner; Zasadzinski; Schwartz; *Magnetic Needle Viscometer for Langmuir Monolayers*, *Langmuir* **2002**, 18, 2800-2806.

Membrane Fusion I

1765-Pos Board B675
The Mechanism of Calcium-Mediated Hemifusion on the Pathway to Fusion
Jason M. Warner, Ben O'Shaughnessy.
In many synthetic and biological membrane systems the pathway to fusion passes through a hemifused intermediate where only proximal leaflets